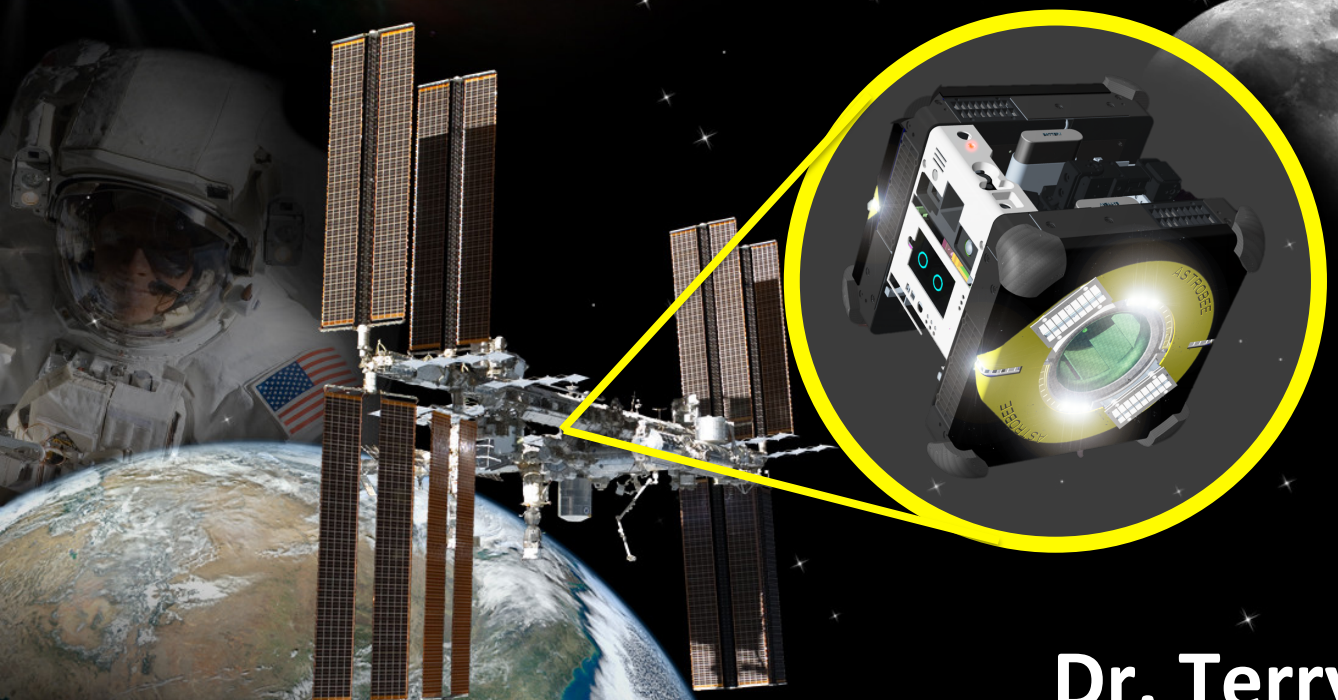
Astrobee

A free-flying robot for the International Space Station



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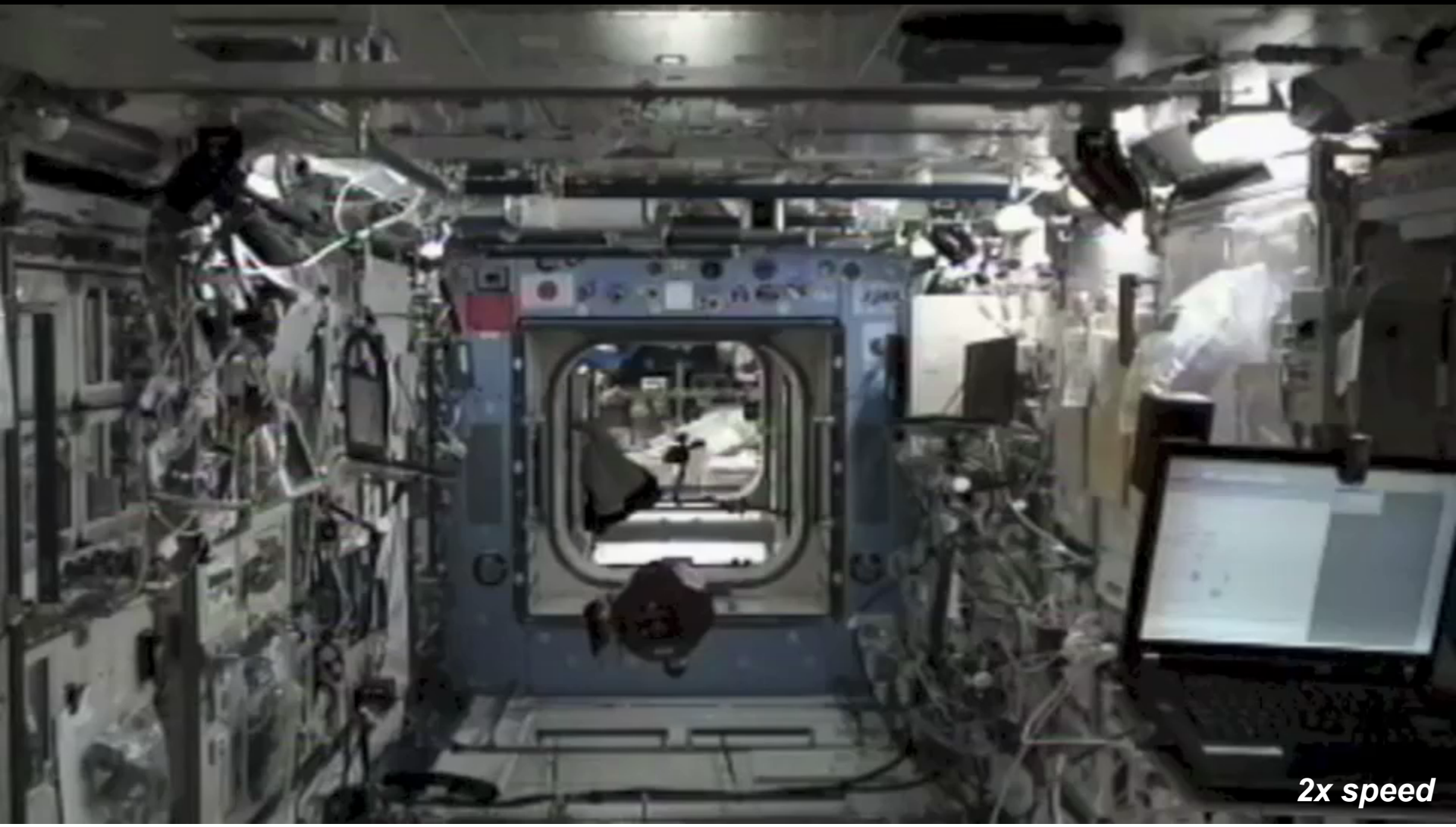
A long time ago, in a galaxy
far, far away...

Remote Control of SPHERES



December 2012

Crew: Kevin Ford, Expedition 33 Commander

Astrobee IVA Free-Flying Robot

Key Facts

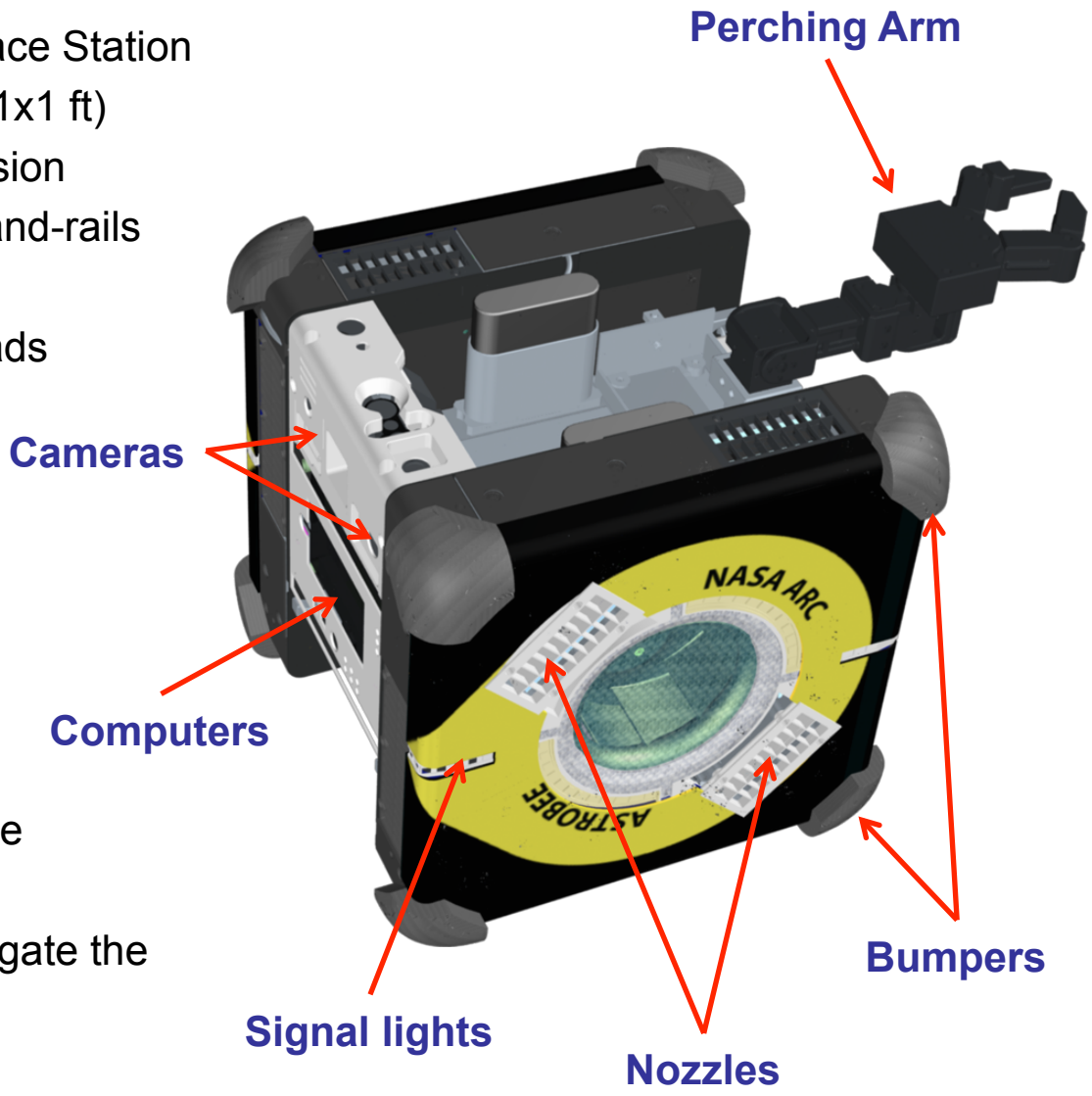
- Free flying robot **inside** the Space Station
- Size: 30x30x30 cm (approx. 1x1x1 ft)
- **All electric** + fan-based propulsion
- Robot arm for "**perching**" on hand-rails
- Three **smartphone** computers
- **Expansion port** for new payloads
- Open-source software

Uses

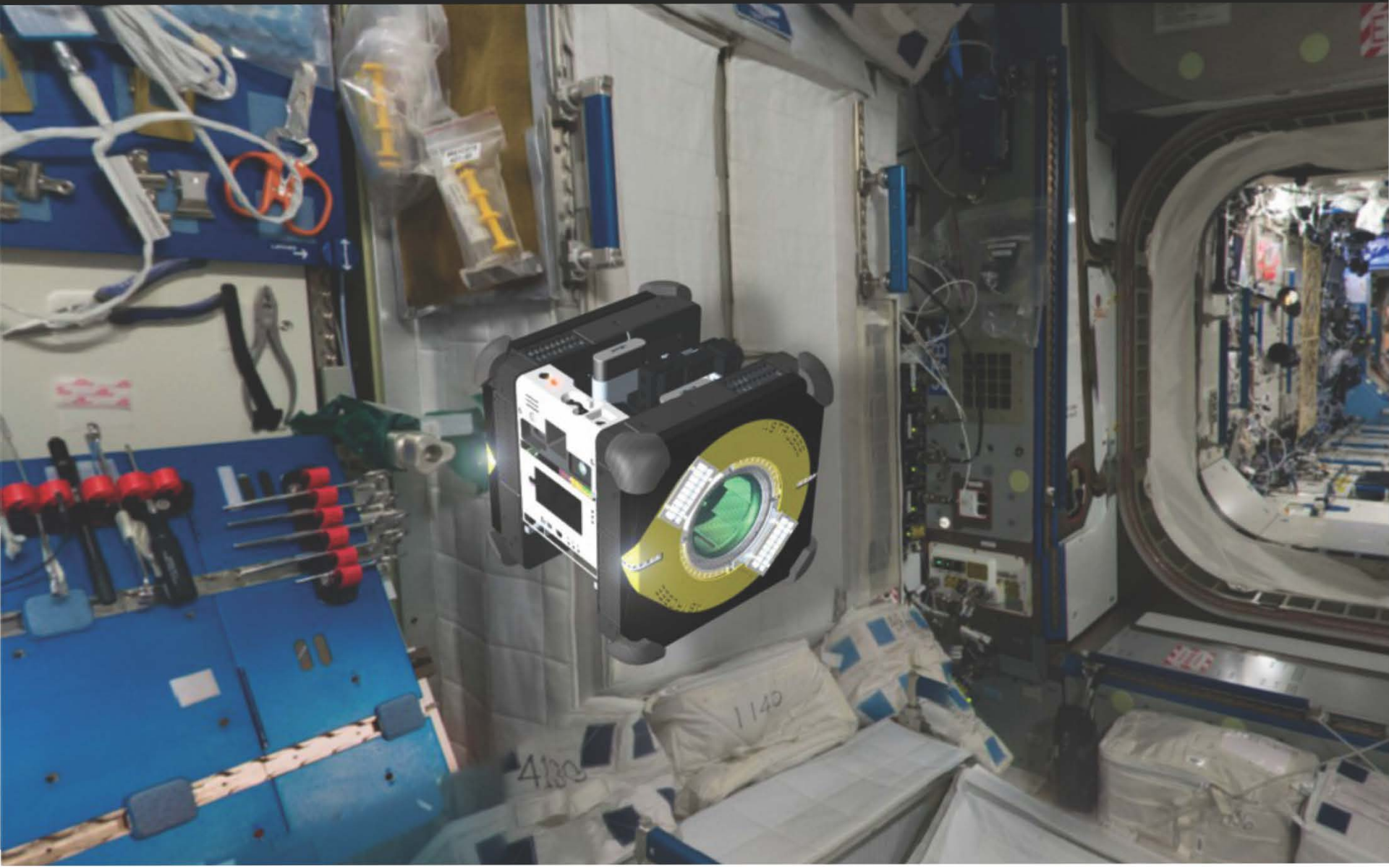
- Mobile sensor
- Remotely operated camera
- Zero-G robotic research

New Technology

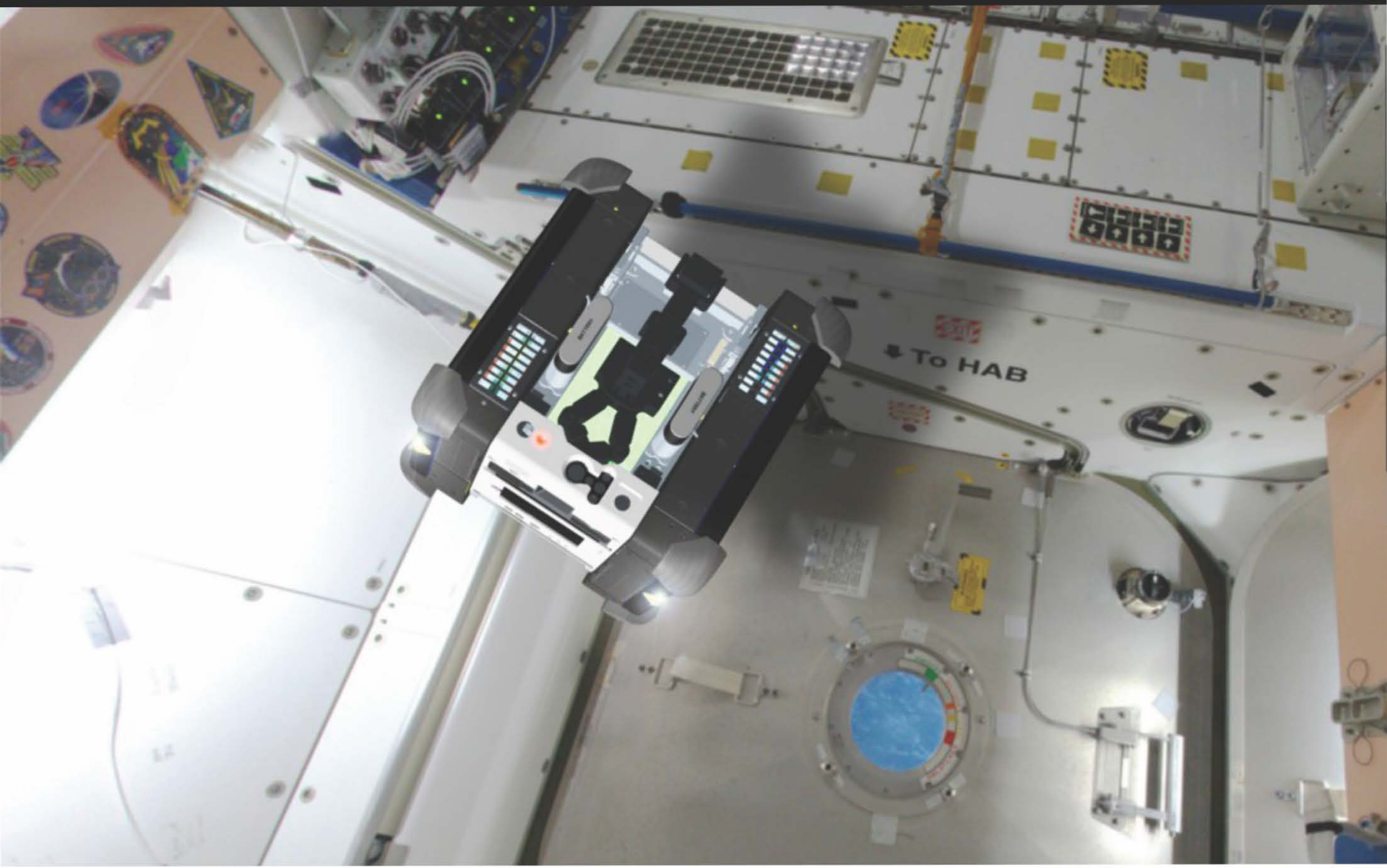
- Autonomous docking & recharge
- Autonomous perching
- Uses on-board cameras to navigate the Space Station



Astrobee on the Space Station (concept)



Astrobee on the Space Station (concept)



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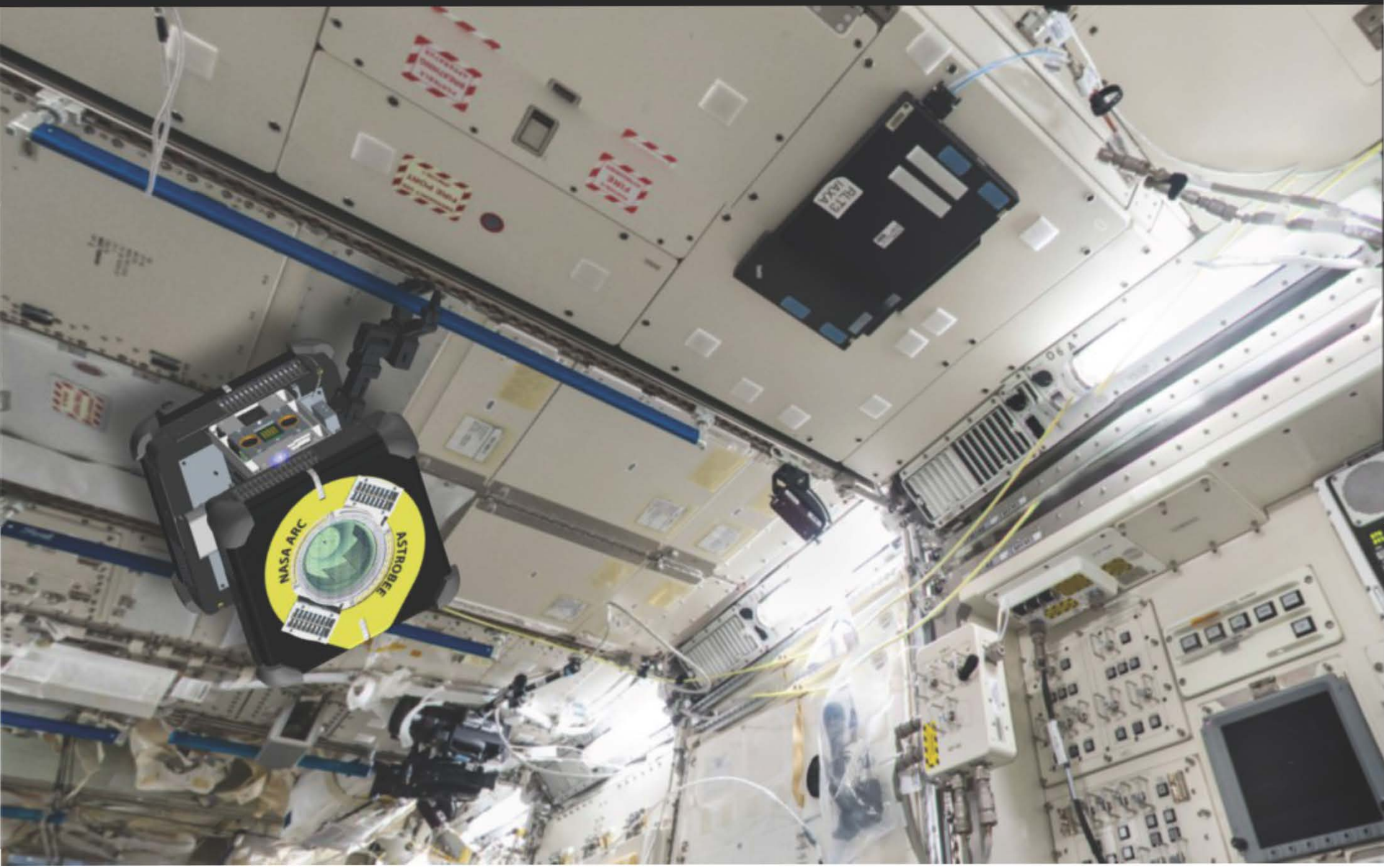
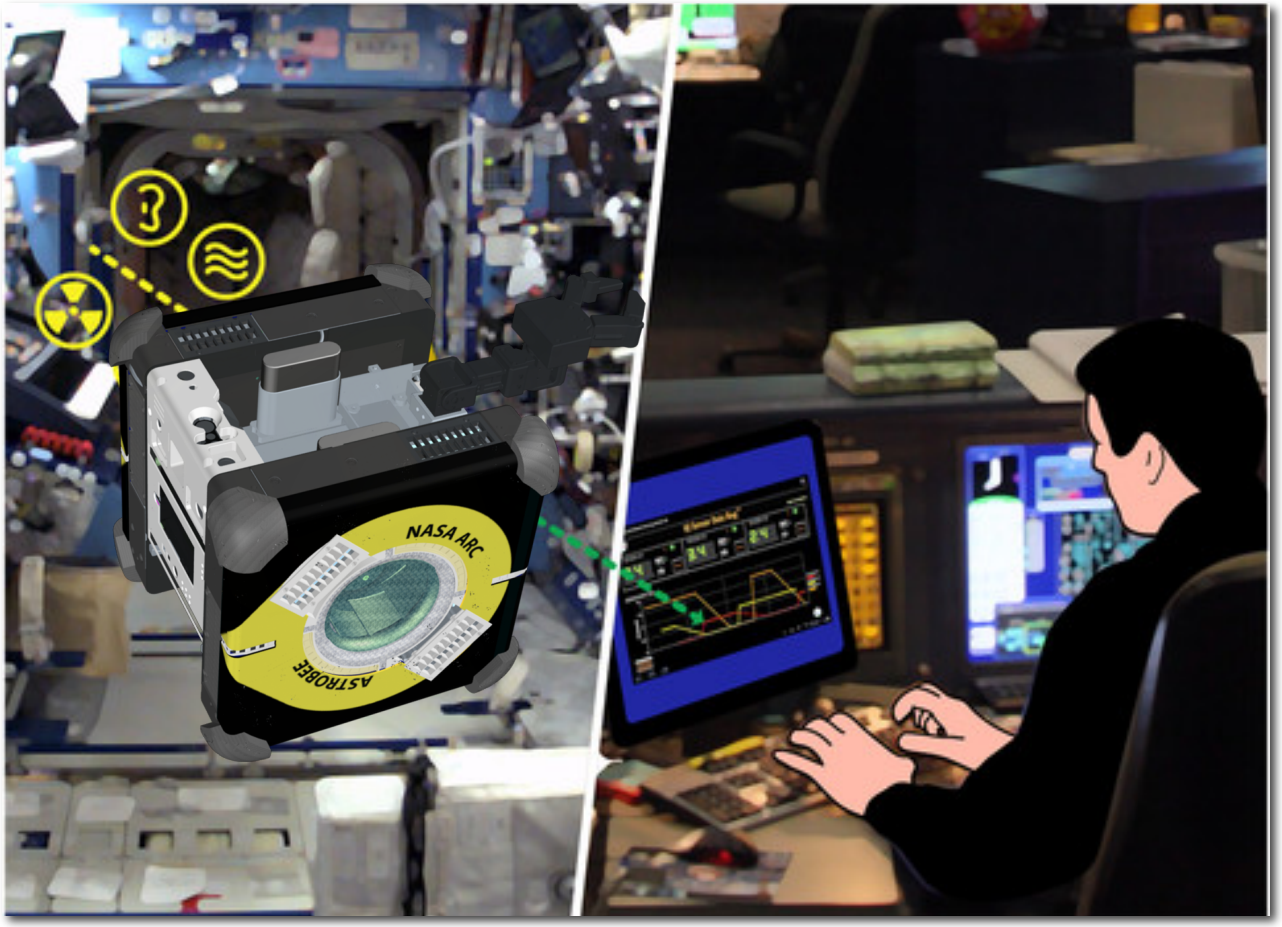


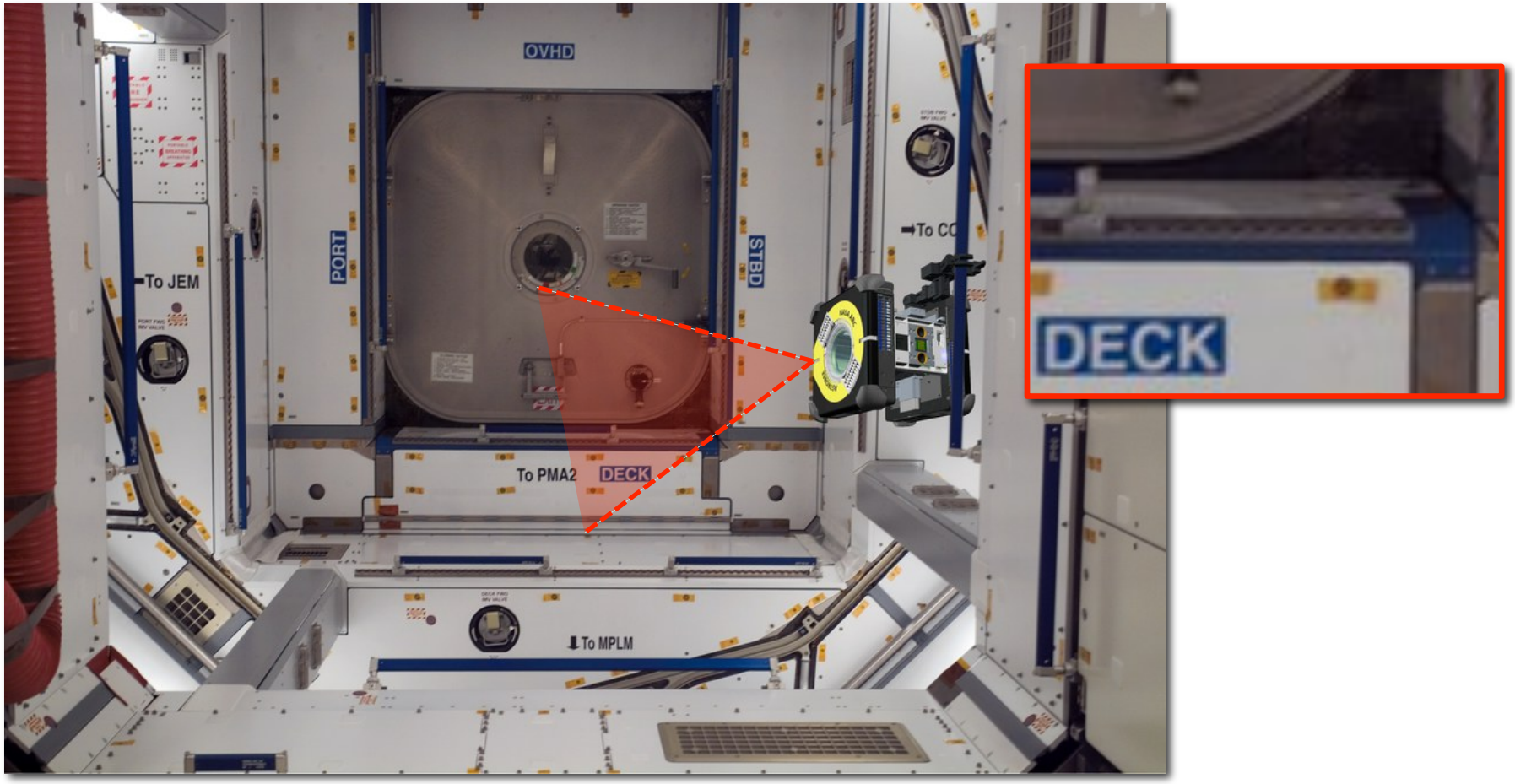
Mobile Sensor



Mission control remotely operates robot to perform …

- Inventory (RFID tag scanning)
- Environment surveys (air quality, sound levels, etc)

Mobile Camera



Mission control remotely operates robot as a mobile camera to:

- Support astronaut work
- Better understand conditions inside the Space Station

Zero-G Robotic Research

Engineers, researchers, & students can use Astrobee for experiments

- New payloads – sensors, mechanisms, etc.
- New software – control, human-robot interaction, perception, etc.

Lab Testing

June 2016

Dock release and control software testing at NASA Ames

Why “Astrobee”?

NEW YORK COMIC CON OCTOBER 9-12, 2014

TopCoder challenge

- Announced at NY ComicCon
- 818 registrants (record for this type of challenge)